

**CLAIMS**

1. A transmission secondary electron emitter which emits secondary electrons generated by the incidence of primary electrons, the transmission  
5 secondary electron emitter comprising:

a secondary electron emitting layer which is made of diamond or a material containing diamond as a main component, and of which one surface is the surface of incidence for making the primary electrons incident  
10 thereon, and the other surface is the surface of emission for emitting the secondary electrons; and

a voltage applying means for applying a predetermined voltage between the surfaces of the incidence and the emission of the secondary electron  
15 emitting layer.

2. The transmission secondary electron emitter according to Claim 1, further comprising a supporting means for reinforcing the mechanical strength of the secondary electron emitting layer.

20 3. The transmission secondary electron emitter according to Claim 1 or 2, wherein the secondary electron emitting layer is made of polycrystalline diamond or a material containing polycrystalline diamond as a main component.

25 4. The transmission secondary electron emitter according to Claim 3, wherein the surface and the grain

boundary face of the polycrystalline diamond of the secondary electron emitting layer are terminated with oxygen.

5        5. The transmission secondary electron emitter according to any one of Claims 1 to 4, wherein the surface of the emission of the secondary electron emitting layer is terminated with hydrogen.

10       6. The transmission secondary electron emitter according to any one of Claims 1 to 4, wherein the surface of the emission of the secondary electron emitting layer is terminated with oxygen.

15       7. The transmission secondary electron emitter according to any one of Claims 1 to 6, wherein an active layer for lowering the work function of the secondary electron emitting layer is formed on the surface of the emission of the secondary electron emitting layer.

20       8. The transmission secondary electron emitter according to Claim 7, wherein the active layer of the secondary electron emitting layer comprises an alkali metal, an oxide of the alkali metal, or a fluoride of the alkali metal.

25       9. An electron tube comprising:  
the transmission secondary electron emitter according to any one of Claims 1 to 8;  
an electron source for emitting the primary

electrons to the transmission secondary electron emitter;

an anode for collecting the secondary electrons emitted from the transmission secondary electron emitter; and

an envelope for accommodating the transmission secondary electron emitter, the electron source, and the anode.

10. The electron tube according to Claim 9, wherein the electron source includes a photocathode for emitting photoelectrons excited by incident light to be detected as the primary electrons.

11. The electron tube according to Claim 9, wherein the electron source includes a photocathode for emitting photoelectrons excited by incident light to be detected as the primary electrons, and the anode has a fluorescent screen emitting light by the incidence of the secondary electrons.

12. The electron tube according to Claim 9, wherein the electron source includes a field emission electron source, and the anode has a fluorescent screen emitting light by the incidence of the secondary electrons.

13. The electron tube according to Claim 9, wherein the electron source includes a field emission electron source array in which a plurality of field

emission electron sources are arranged in an array, and the anode has a fluorescent screen emitting light by the incidence of the secondary electrons.